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A NEW STATUS FOR \times HABENARIA ANDREWSII

BY
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ONE of the most difficult problems in the Orchidaceae of the eastern United States is that concerning the Purple-fringed Habenarias. An examination of herbarium material, and literature on the subject, should readily convince one that this statement is not an exaggeration.

In 1840, Asa Gray, writing of *Habenaria psycodes* (L.) Spreng. (in Am. Journ. Sci. and Arts 38: 309), said: "So great is the confusion of the synonymy, and so extensive the series of mistakes in regard to this species, that it becomes at first sight questionable whether the Linnean name should not be altogether dropped. But as the description of Linnaeus is perfectly applicable to the species he had in view, and to no other, we are not at liberty to pass by the original name; still less to apply it to a plant subsequently mistaken for this species." Gray retained *H. psycodes* as a true species and reduced the large-flowered plant to *H. psycodes* var. *grandiflora* (Bigel.) A. Gray.

In his work on the genus *Habenaria* in North America, Ames (Orchidaceae 4 (1910) 187) wrote: "It is a hopeless task to attempt to arrive at satisfactory conclusions regarding the correct synonymy of *Habenaria psycodes* and *H. fimbriata*. Early in the history of these

closely allied species confusion was established, and although several authors have endeavored to eliminate it there are obstacles which it is probable will always exist. Botanists have reported their material under one name or the other, and have, with few exceptions, added confusion by unstudied references to literature." Ames, who had an opportunity to examine the type specimens, continued: "For example, Lindley described two varieties of *H. psycodes* which are clearly referable to *H. lacera*, as an examination of his specimens will prove. In his synonymy he refers directly to *Orchis psycodes* L. His *Platanthera crispa*, on the other hand, which he suggested was a natural hybrid, is equivalent to *H. psycodes*, to which species his material identified as *P. incisa* should also be referred. Lindley's material of *P. fimbriata* is conspecific with *H. psycodes*, and his *P. grandiflora* is simply *H. fimbriata*."

In 1929, Morris and Eames (Our Wild Orchids, p. 164) said: "...there is little or no structural difference to separate it [*H. fimbriata* (Dryander) R.Br. from *H. psycodes*]; the greater divergence of the anther cells, the denticulation of the petals continued down their lateral margins as well as on the apex, even the looser more spreading habit of raceme so often found, are distinctions that tend to disappear where both forms are much of a size." They retained *H. fimbriata*, however, as a separate species from *H. psycodes*, basing their retention on the difference in the size of the flowers. They said (l.c. 162) that in the northeast corner of its range *H. fimbriata* "...is so much larger than the Butterfly Orchid [*H. psycodes*] that the two can hardly even be compared, let alone confused."

Ames, admitting the confusion which existed concerning these two forms of the Purple-fringed Habenarias (l.c. 187), wrote: "The difficulties are increased ten-

fold when it is realized that *H. psycodes* and *H. fimbriata* are so similar that they are distinguishable only by arbitrary rules. In the preparation of the Orchidaceae for Gray's New Manual a conscientious effort was made to ascertain the distinctive characters of these two species. Although every conspicuous character was carefully studied it was found that the most reliable distinction was the depth of the fringe on the divisions of the labellum; in *H. psycodes* this being one-third the depth of the divisions or less, and in *H. fimbriata* one-third or more."

In its present condition the problem may well be expressed in the words of Gibson (Our Native Orchids (1905) 63): "In the bother of mentally calculating whether a certain specimen of purple-fringed orchis is a large specimen of *H. psycodes*, or a small one of *H. grandiflora*, one is distracted from an enjoyment of its beauty, and is tempted to feel a trifle of impatience at the naming of names, and to wish one were back in the Garden of Eden, where, according to the little boy's version, 'Adam called the elephant an elephant because it looked like an elephant'." It would be pleasant, indeed, to follow Adam's method of naming things, but taxonomy would not, in the end, benefit by such a system.

In 1901, Andrews described, as follows, a plant which he said was a hybrid between *H. psycodes* and *H. lacera* (Michx.) Lodd. (in *Rhodora* 3:246): "Lower leaves as in *H. lacera* length to 15 cm., width to 3 cm., ratio 5-7:1. Raceme oblong, loosely fewer-flowered. Flowers white tinted rose to light rose-purple. Sepals round-oval, obtuse, lateral deflexed, plane, vertical. Petals cuneate-spatulate, obtuse or slightly retuse, denticulate above, slightly surpassing upper sepal in ratio of about 6:5. Average width of lip about 12 mm. Divisions narrow-cuneate, deeply cleft as in *H. lacera*, few, averaging twice as many as in *lacera*, capillary, long. Arms of col-

umn as in *H. psychodes* or slightly more acute. Glands of pollen-masses slightly oblique, elliptical or slightly kidney-shaped. Pollen-masses intermediate in length, club-shaped; stalk $\frac{3}{4}$ length of mass of pollen or rather more; pollen greenish-yellow. Somewhat two lobed projection from base of stigma not completely obstructing orifice of nectary in middle as in *lacera*. Spur longer than ovary, clavate, much enlarged below. Ovary short or intermediate, 9–12 mm. Locality . . . a very wet meadow in Pownal, Vermont, July 22, 1898 (M. W. White & A. L. Andrews), Aug. 5, 1901 (A. L. Andrews).” Later, in 1904, Miss Niles (Bog-trotting for Orchids, p. 258) published as *Habenaria Andrewsii* White the plant Andrews had described.

After examining numerous sheets of the *H. psychodes*-*H. fimbriata* complex, I have come to the conclusion that perhaps the most confusing element in this group is the common occurrence of hybrid plants of *H. psychodes* \times *H. lacera* and of *H. fimbriata* \times *H. lacera*. It is interesting to note that plants which seem to be so obviously of hybrid origin as do those which I have observed should have escaped the attention of other botanists who have worked with them, and it is perhaps due to the abundance of these hybrid plants that so much confusion has existed in this group in the past. The plants which were first described as \times *H. Andrewsii* seem to me less representative of the hybrid than those shown in Plates I and II. The specimens exhibited by these plates are outwardly more closely allied to the large Purple-fringed Orchid than to the small one. Nevertheless, under the status in which I am considering them, all the hybrid plants observed in this study will be treated as \times *H. Andrewsii*. In order to do this, however, it will be necessary to broaden our conception of the hybrid.

In dealing with the parent species of \times *H. Andrewsii*,

I propose to retain *H. psycodes* (L.) Spreng. as such, based upon an examination of a photograph of the Linnean type and upon his description. Also, since it is practically impossible to segregate many of the plants having intermediate characters into the *H. psycodes* and *H. fimbriata* categories, and because there seem to be no fundamental morphological differences in the plants as a whole, I propose to recognize arbitrarily the larger-flowered plants as *H. psycodes* var. *grandiflora*. Plants of *H. lacera* which are found throughout most of its area of distribution are clearly distinguishable as such and afford no problem. However, some of those plants found in the northern extremes of its distribution have, in some cases, been confused with $\times H. Andrewsii$ and *H. psycodes*.

Considering the above status of the Purple-fringed Habenarias, and realizing the great variability which is characteristic of hybrid plants, I have deemed it best to group all of the hybrids into one polymorphic, heterogeneous category instead of trying to distinguish individual hybrid plants of *H. psycodes* \times *H. lacera* from those of *H. psycodes* var. *grandiflora* \times *H. lacera*. I feel confident that, if the above suggestions are taken into consideration, much of the confusion of the past will be clarified and the future treatment of these plants greatly simplified.

With this broader conception of $\times H. Andrewsii$ in mind, I believe that a reexamination of Lindley's specimens may possibly disclose that he had in hand one or more of the various forms of the hybrid which led him to recognize five segregates in this bewildering group of plants; but this, of course, is mere supposition. If, however, one of his type specimens should prove to be the hybrid it would become necessary to adopt this earlier name and thus relegate $\times H. Andrewsii$ to synonymy.

An examination of the floral illustrations of $\times H. Andrewsii$ (Plate I, figs. 5-8; Plate II, figs. 16-22) will show a great variation in the flowers of this hybrid, particularly so in the median lobe of the lip which may be entire and spatulate-clavate to deeply-fringed and broadly cuneate or narrowly flabellate. The median lobe, as well as the lateral lobes, of the lip of $\times H. Andrewsii$ is consistently narrower than in *H. psycodes* or in *H. psycodes* var. *grandiflora*, and wider and longer than in *H. lacera*. The capillary fringes, when present, are for the most part longer than in either of the purple-fringed plants and more numerous than in *H. lacera*. The most constant character of the hybrid, and the one which immediately distinguishes it, is the shape of the petals. They are inclined to be linear-oblong to linear-spatulate as in *H. lacera*. However, although they are for the most part entire, they may also be somewhat denticulate as in the Purple-fringed Orchids.

It is highly probable that further examination of herbarium material of *H. psycodes* and *H. psycodes* var. *grandiflora* will disclose that the hybrid has a much wider range than is known at present, and that it is not at all uncommon. I am citing all the material which I have thus far seen. According to these records, the hybrid ranges from Newfoundland, Nova Scotia, New Brunswick, Quebec, through New England, New York, and New Jersey, south to North Carolina.

The greatest number of collections of $\times H. Andrewsii$ has been made from New England northward. This is to be expected since the parent species are most abundant in that region and are often found growing in close proximity to one another in the same locality. Southward, *H. psycodes* and *H. psycodes* var. *grandiflora* are confined to the mountains and they become increasingly rarer as they approach their southern limits of distribution. *H.*

lacera, however, not only occurs somewhat sparingly in the mountains, but also extends out into the higher hills of the Piedmont Plateau in Alabama, Georgia and South Carolina, and even into the Coastal Plain of North Carolina. Therefore, besides becoming rarer, the parent species become widely scattered as they approach their southern limits.

According to the specimens examined, *H. lacera* has been found in only two counties in the southeastern states where at least one of the purple-fringed segregates has also been found. These are Mitchell and Transylvania Counties in North Carolina. This absence of the parent species growing in the same region accounts, perhaps, for the rarity of $\times H. Andrewsii$ south of New England.

DESCRIPTION : Roots somewhat fleshy, fusiform, elongated. Plant essentially glabrous throughout, 16–75 cm. high. Leaves oblong-obovate, elliptic or lanceolate, 7–20 cm. long, 2.5–8 cm. wide. Dorsal sepal oblong to ovate-elliptic or ovate-orbicular, concave, obtuse, 4–9 mm. long, 2–5 mm. wide. Lateral sepals asymmetrically ovate, ovate-elliptic or ovate-oblong, obtuse to acute, 4–11 mm. long, 2–6 mm. wide. Petals essentially linear-oblong (oblong-elliptic to narrowly oblong-spatulate), essentially entire, commonly with irregularly denticulate-crenulate margins, erose, or rarely with obsolescent subhastate-fringed lobes at base with entire upper half, 4–11 mm. long, 1–4 mm. wide; apex broadly rounded, obtuse-truncate, rarely sinuate-retuse. Lip tripartite, 6–17 mm. long, 8–22 mm. wide across the lateral lobes; lateral lobes narrowly cuneate-flabellate, 5–11 mm. long, lacinate half way to the base or more (often to the base) with long capillary fringes; median lobe entire and spatulate-clavate to deeply-fringed and broadly cuneate or narrowly flabellate, rarely narrowly oblong-spatulate or orbicular with coarse, shallowly eroded apex, 4–14 mm. wide. Spur

slightly to strongly clavate, curved, 1.3–3.5 cm. long.

The following collections of *×H. Andrewsii* have been examined:

NEWFOUNDLAND: Avalon Peninsula, shores of Conception Bay, boggy meadow overlying clay-slates, sandstones, and quartzites, along Upper Gully, Killigrew's (fls. cream-colored, rarely crimson), Aug. 3, 1911, *M.L. Fernald and K.M. Wiegand 5216* (Gray and Ames Herbaria). Force le Plain, Harry's Brook, July 12, 1930, *Rachel B. Kennedy 345* (Gray Herb.). Force le Plain, Harry's Brook, July 27, 1930, *Rachel B. Kennedy 409* (Gray Herb.).

NOVA SCOTIA: Cape Breton Co., North Sydney, boggy places, July 12, 1883, *John Macoun* (Gray Herb.). Halifax Co., swale near Wellington Station, Shubenacadie, Grand Lake, July 27, 1921, *M.L. Fernald, E. B. Bartram, and B. Long 23705*, in part (Gray Herb.). Pictou Co., near Pictou, damp meadow, July 12–18, 1901, *C.D. Howe and W.F. Lang 546* (Gray Herb.).

NEW BRUNSWICK: Westmorland Co., Shediac Cape, moist grassland with *H. fimbriata* and *H. lacera* (lavender tinted almost white), Aug. 4, 1914, *F.T. Hubbard* (Pl. II, fig. 17) (Ames Herb.); Shediac, moist roadside (fls. pale lilac), Aug. 1, 1910, *F.T. Hubbard 4* (Ames Herb.); Shediac, moist roadside (fls. white), Aug. 1, 1910, *F.T. Hubbard 5* (Ames Herb.); Shediac, moist roadside (fls. almost white), July 30, 1910, *F.T. Hubbard 3* (Ames Herb.); Shediac Cape, moist grassland, with *H. fimbriata* and *lacera* (white), Aug. 4, 1914, *F.T. Hubbard* (Pl. II, fig. 19) (Ames Herb.); Shediac Cape, with *H. fimbriata* and *H. lacera* (light lavender-purple), Aug. 4, 1914, *F.T. Hubbard No. D* (Pl. I, fig. 7) (Gray Herb.); Shediac Cape, with *H. fimbriata* and *H. lacera* in moist grassland (lavender tinted almost white), Aug. 4, 1914, *F.T. Hubbard No. C* (Pl. I, fig. 5) (Gray Herb.); Shediac Cape, with *H. fimbriata* and *H. lacera* in moist grassland (white), Aug. 4, 1914, *F.T. Hubbard No. B* (Pl. II, fig. 22) (Gray Herb.); Shediac Cape, moist grassland with *H. psycodes* (pale purple), Aug. 4, 1914, *F.T. Hubbard* (Gray Herb.); Shediac Cape, with *H. fimbriata* and *lacera* in moist grassy land (pale lavender), Aug. 4, 1914, *F.T. Hubbard No. A* (Pl. I, fig. 6) (Gray Herb.); Shediac Cape, with *H. fimbriata* in moist grassland (white), Aug. 4, 1914, *F.T. Hubbard* (Pl. II, fig. 21) (Gray Herb.); Shediac Cape, with *H. fimbriata* and *lacera*, moist grassland (pale lavender), Aug. 4, 1914, *F.T. Hubbard*

(Pl. II, fig. 18) (Ames Herb.). Ingleside, July 18, 1904, *G. U. Hay* (Gray Herb.).

QUEBEC: Quebec Co., Bois près du Lac des Roches, (Laurentides) 7 milles au nord de Québec, 3 août 1922, *Fr. M. Victorin 16031*, in part (Gray Herb.).

MAINE: Franklin Co., So. Chesterville, *Miss L. O. Eaton* (Ames Herb.). Oxford Co., Grafton (alba), Aug., 1888, *J. C. Parlin* (Gray Herb.); Bethel, road to Grafton (fls. pure white), July 25, 1895, *E. F. Williams* (Gray Herb.). Piscataquis Co., near City Camp, Wassataquoik Valley, July 17, 1900, *E. F. Williams 1* (Gray Herb.). Washington Co., Hamilton Cove, Lubec, meadow, Aug. 2, 1909, *M. L. Fernald, 1662c, 1662d* (Pl. II, fig. 20), *1662e, 1662g* (Pl. I, fig. 8) (Gray Herb.); Hamilton Cove, Lubec, meadow, Aug. 2, 1909, *M. L. Fernald 1662f* (Pl. II, fig. 16) (Ames Herb.). Middle Dam (fls. white), Aug. 2, 1903, *E. F. Williams 2* (Gray Herb.).

NEW HAMPSHIRE: Coös Co., Berlin, July 24, 1901, *Tinnie Wheeler* (Gray Herb.); Randolph, July 31, 1902, *A. H. Moore 269* (Gray Herb.). Grafton Co., Orford, Aug. 2, 1907, *E. F. Williams* (Gray Herb.); Bethlehem, Strawberry Hill, July 21, 1891, *J. F. Collins* (Gray Herb.); Hillsboro Co., Manchester (fls. pure white before drying, also fragrant), July 20, 1899, *F. W. Batchelder* (Gray Herb.). Crystal Peak, Squam Range, swamp in brook bed, elev. 1,000 ft., July 10, 1919, *A. E. Lownes* (Ames Herb.).

VERMONT: Bennington Co., Pownal, wet meadow, Aug. 5, 1901, *A. L. Andrews* (TYPE) (Gray Herb.); Pownal, wet meadow, Aug. 4, 1902, *A. L. Andrews* (Co-TYPE) (Ames Herb.). Washington Co., one mile north of South Duxbury, in open, moist bog (growing with *H. lacera* and *H. psycodes*), Aug. 8, 1937, *D. S. and H. B. Correll 7834* (Ames and Duke Univ. Herbaria). Windham Co., Westminster, 1901, *W. H. Blanchard* (Gray Herb.).

MASSACHUSETTS: Berkshire Co., Pittsfield, July, 1922, *E. H. Lincoln* (Mr. L. thinks this is the hybrid) (Ames Herb.). Norfolk Co., Dedham, Purgatory Swamp, June 14, 1889, ex Herb. *E. and C. E. Faxon* (Gray Herb.).

NEW YORK: Herkimer Co., Wilmont, swampy flats at head of North Lake (form), July 14, 1902, *J. V. Haberer 1898* (Ames Herb.). Oneida Co., White Lake, Forest Port, along Bear Creek, July 12, 1903, *J. V. Haberer 2679* (Ames Herb.).

NEW JERSEY: Summit Mt., July 29, 1898, *J.C. Brunherste* (Ames Herb.).

NORTH CAROLINA: *Buncombe Co.*: near Balsam Gap, in weeds along path in open balsam woods (fis. rose-lavender), July 30, 1934, *D.S. Correll 142* (Duke Univ. Herb.); near Balsam Gap, growing in rich, moist, weedy soil beneath balsam trees, pH 5, Aug. 8, 1935, *D. S. Correll 3818* (Duke Univ. Herb.).

It was largely through the study of Mr. F. Tracy Hubbard's excellently prepared New Brunswick specimens that I was enabled to arrive at satisfactory conclusions concerning \times *H. Andrewsii*. I wish to thank Professor Oakes Ames, Mr. Charles Schweinfurth and Mr. F. Tracy Hubbard for their helpful suggestions and criticisms.

EXPLANATION OF PLATES

The flowers illustrated in Plates I and II are natural size. They are shown as they were originally pressed in the field.

PLATE I

- 1-4. *Habenaria lacera*: New Brunswick: Westmorland Co., Shediac Cape, moist grassland with Carices (toothed petals), July 28, 1914, *F. T. Hubbard* (Gray Herb.). [Petals of all the flowers not toothed—D.S.D.]
5. \times *H. Andrewsii*: New Brunswick: Westmorland Co., Shediac Cape, with *H. fimbriata* and *H. lacera*, in moist grassland (lavender tinted almost white), Aug. 4, 1914, *F. T. Hubbard* No. C (Gray Herb.).
6. \times *H. Andrewsii*: New Brunswick: Westmorland Co., Shediac Cape, with *H. fimbriata* and *lacera* in moist grassy land (pale lavender), Aug. 4, 1914, *F. T. Hubbard* No. A (Gray Herb.).
7. \times *H. Andrewsii*: New Brunswick: Westmorland Co., Shediac Cape, with *H. fimbriata* and *H. lacera* (light lavender-purple), Aug. 4, 1914, *F. T. Hubbard* No. D (Gray Herb.).
8. \times *H. Andrewsii*: Maine: Washington Co., Hamilton Cove, Lubec, meadow, Aug. 2, 1909, *M. L. Fernald* 1662g (Gray Herb.).
9. *H. psycodes* var. *grandiflora*: Massachusetts: Norfolk Co., Purgatory-Dedham, July 10, 1861 (no collector given) (Gray Herb.).
10. *H. psycodes* var. *grandiflora*: New Brunswick: Westmorland Co., Shediac Cape, moist grassland, Aug. 4, 1914, *F. T. Hubbard* (Gray Herb.).
11. *H. psycodes*: New Brunswick: Westmorland Co., Shediac Cape, rich low pasture in moss, Aug. 2, 1914, *F. T. Hubbard* (Gray Herb.).
12. *H. psycodes*: New Brunswick: Westmorland Co., Shediac Cape, moist grassland (white), Aug. 4, 1914, *F. T. Hubbard* (Gray Herb.).

PLATE II

- 13-14. *H. lacera*: New Brunswick: Westmorland Co., Shediac Cape, moist grassland with *Carices*, July 28, 1914, *F. T. Hubbard* (Ames Herb.).
15. *H. lacera*: Massachusetts: Bristol Co., North Easton, July, 1898, *Carl Blomberg* (Ames Herb.).
16. × *H. Andrewsii*: Maine: Washington Co., Hamilton Cove, Lubec, meadow, Aug. 2, 1909, *M. L. Fernald 1662f* (Ames Herb.).
17. × *H. Andrewsii*: New Brunswick: Westmorland Co., Shediac Cape, moist grassland, with *H. fimbriata* and *H. lacera* (lavender tinted almost white), Aug. 4, 1914, *F. T. Hubbard* (Ames Herb.).
18. × *H. Andrewsii*: New Brunswick: Westmorland Co., Shediac Cape, with *H. fimbriata* and *lacera*, moist grassland (pale lavender), Aug. 4, 1914, *F. T. Hubbard* (Ames Herb.).
19. × *H. Andrewsii*: New Brunswick: Westmorland Co., Shediac Cape, with *H. fimbriata* and *lacera*, moist grassland (white), Aug. 4, 1914, *F. T. Hubbard* (Ames Herb.).
20. × *H. Andrewsii*: Maine: Washington Co., Hamilton Cove, Lubec, meadow, Aug. 2, 1909, *M. L. Fernald 1662d* (Gray Herb.).
21. × *H. Andrewsii*: New Brunswick: Westmorland Co., Shediac Cape, with *H. fimbriata* in moist grassland (white), Aug. 4, 1914, *F. T. Hubbard* (Gray Herb.).
22. × *H. Andrewsii*: New Brunswick: Westmorland Co., Shediac Cape, with *H. fimbriata* and *H. lacera* in moist grassland (white), Aug. 4, 1914, *F. T. Hubbard No. B* (Gray Herb.).
23. *H. psycodes*: New Brunswick: Westmorland Co., Shediac Cape, wet, low pasture in moss, Aug. 2, 1914, *F. T. Hubbard* (Ames Herb.).
24. *H. psycodes* var. *grandiflora*: New Brunswick: Westmorland Co., Shediac Cape, moist grassland, Aug. 4, 1914, *F. T. Hubbard* (Ames Herb.).
- 25-26. *H. psycodes* var. *grandiflora*: Massachusetts: Middlesex Co., North Tewksbury, in open, boggy woods, June 26, 1902, *Oakes Ames* (Ames Herb.).
27. *H. psycodes* var. *grandiflora*: Massachusetts: Middlesex Co., North Tewksbury, in rich, boggy woods with *Veratrum viride*, June 26, 1902, *Oakes and Blanche Ames* (Ames Herb.).



The following are the names of the persons who have been elected to the office of the Secretary of the Association for the year 1874.

Mr. J. H. Brown, of the State of New York, has been elected Secretary of the Association for the year 1874.

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